ANALYSIS OF COMMONLY OCCURRING MAJOR ADVERSE CARDIOVASCULAR EVENTS AND THE EFFECT OF PATIENT COUNSELLING IN DIABETIC POPULATION

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Abstract: As they are many Major Adverse Cardiovascular Events (MACE) were observed among diabetic population , our study's purpose mainly focuses on analysing which type of Major Adverse Cardiovascular Events (MACE) among diabetic population and the effect of patient counselling through knowledge, attitude and practice (KAP) questionnaire in diabetic population. In this way our study helps in providing which type of Major Adverse Cardiovascular Events (MACE) were observed among diabetic population and importance of patient counselling. The study was conducted for a period of 6 months from October 2018 to March 2019.

Index Terms: **Diabetes mellitus, MACE (major adverse cardiovascular events), cardiovascular diseases, knowledge, attitude and practice (KAP) questionnaire .**

I. INTRODUCTION

Cardiovascular disease (CVD) remains a leading cause of morbidity and mortality in type 1 diabetes mellitus and type 2 diabetes mellitus (T2D). Beyond the inherent increase in mortality in diabetic subjects, when diabetes mellitus is combined with manifestations of CVD, such as myocardial infarction or stroke, the mortality rate is nearly doubled, leading to an estimated reduction in life expectancy of ≈12 years. Five specific risk factors for CVD were included in the model: elevated level of glycated hemoglobin, elevated level of LDL (low-density lipoprotein) cholesterol level, albuminuria, smoking status, and elevated blood pressure levels. The T2D population who had these 5 risk factor variables within the target range, there was no significant excess risk of death, myocardial infarction, or stroke when compared with the control population. Importantly, elevation of the glycated hemoglobin outside the target range was the strongest predictor of stroke and acute myocardial infarction.Yet, although strict control of hyperglycemia may afford some benefit in reduction of major macrovascular events in patients with type 1 diabetes mellitus and T2D. There is an urgent need to identify new therapies for diabetes mellitus and its CVD consequences to enhance quality and duration of life in the ever-growing number of subjects affected by these disorders[1]. A variety of modifiable risk factors, including diabetes, on the risks of major cardiovascular diseases and other common causes of death in populations.[2]

III. NEED FOR THE STUDY:

- As the Major Adverse Cardiovascular Events (MACE) increased in diabetic population. The primary objective of our study is to analyse commonly occurring major adverse cardiovascular events in diabetic population .
- The study also concentrated on the effect of patient counselling through knowledge, attitude and practice (KAP) questionnaire in diabetic population.

Nutritional Recommendations for Individuals with Diabetes

People with diabetes can work with their health care team to develop and use an action plan to reach their ABC goals. An action plan can help people to:

1. Reach and stay at a healthy weight. Being overweight or obese is a risk factor for heart attack and stroke.

2. Get at least 30 to 60 minutes of physical activity. Brisk walking or a similar activity most days of the week can help with weight loss and lower blood pressure.

3. Eat foods that are low in saturated fats, trans fats, cholesterol, salt (sodium), and added sugars – choose lean meats, poultry, fish, nuts (in small amounts), fat free or low fat milk, and milk products.

4. Eat more fiber – whole grains, fruits, vegetables, and dry peas and beans. · Stop smoking – or ask their health care team for help to quit.

5. Take medications as directed – and ask their doctor about taking daily aspirin.

6. The single most important thing that you can do for your health and the health of others is to quit using tobacco in any form. Ask family and friends to help them manage their diabetes. This support can help people reach their goals. [3]
A1C,blood pressure and cholesterol goals may need to be adjusted for the individual based on age,duration of diabetes,health history, and other present health conditions.Further recommendations for individualization of goals can be found in the ADA standards of medical care in diabetes.[4]

MATERIALS AND METHODS:

Materials used:

Tool 1: *Patient consent form*

Purpose: To obtain the informed consent from the patient to collect the information from them that is required for the study.

Tool 2: *Data collection form*

Purpose: To collect patient demographics, family history, dietary pattern, social history, age, diagnosis, treatment chart.

Tool 3: *Patient Information Leaflets*

Purpose: It helps in counselling the patients

Tool 4: *KAP-Questionnaire*

Purpose: It helps in assessing the knowledge of patient before and after counselling.

METHODOLOGY:

Study Design: Observational Cross-Sectional Study.

Study Period: The study period is of 6 months from October 2018 to March 2019.

Study Site: Department of General Medicine, Department of Cardiology; Government general hospital, Guntur.

Sample size: Total of **247** subjects who are diagnosed with diabetes.

INCLUSION CRITERIA:

- Age criteria between 18 to 80 years.
- Patients with history of Diabetes for at least 5 years.
- All diabetic patients with CVDs.

EXCLUSION CRITERIA:

- Age less than 18 years.
- Patients who have Congenital Heart Anomalies, Psoriasis, Rheumatoid Arthritis, SLE and any other autoimmune disorders.
- Patients with Diabetic history less than 5 years.
- Pregnant women.

PLAN OF WORK:

- The study was conducted in the department of General Medicine, department of Cardiology; Government General Hospital, a tertiary care teaching hospital in Guntur.
- Subjects who satisfied study criteria were taken into the study.
- Subject's socio-demographic details like age, duration of Diabetes, Systolic Blood Pressure, HbA1c, lipid profile, present and past medical history, Social habits were collected.
- By collecting the socio-demographic details of the patients the most commonly occurring major adverse cardiovascular events in diabetic population were analysed.
- Subjects are counselled during their visit about lifestyle modification and follow up the patient for 6 months in at least of1-2 visits and assessed the outcomes in order to know the influence of life style on disease outcomes

STATISTICAL ANALYSIS:

Data was statistically analyzed using Microsoft Office Excel worksheet and SPSS.
Student paired t-test was used for nonparametric data. Probability "p" value of less than 0.05 was considered as statistically significant.

RESULTS:

- Figure 1 depicts the information regarding the total number of subjects recruited in the study which was 247 and out of them 119 (48%) were males who were less than128 (52%) female subjects.
- Figure 2 depicts the information regarding the relation between smoking and alcohol consumption with respect to cardiac event history. Subjects who were both Smoking and consuming Alcohol were 52 and that contributed to 90% of them having some cardiac event history when compared to subjects who were Smoking alone were 85 and out of them 78% had cardiac event history where as alcoholics alone were 57 who had developed 87% cardiac event history among them.
- Figure 3 depicts the information regarding distribution of subjects based on HbA1C levels of the subjects. Out of 247, the subjects were divided into two groups Controlled Diabetic group and Uncontrolled group. This shows that majority of the sample taken was found to have Uncontrolled Diabetes 177 (72%) than Controlled Diabetes 70 (28%). Males (89) were more among uncontrolled group where as females (40) dominated the controlled group.
- Figure 4 depicts the information that majority of the Controlled Diabetic patients were found to fall under Pre-Hypertension (12) and Stage – I Hypertension (12) that is 46% and Uncontrolled Diabetic patients were observed to fall under the category of Stage – I Hypertension (77) that is 37%.
- Figure 5 depicts the information that majority of the Controlled Diabetic patients were observed to have total cholesterol under the category of Desirable (3 – 5.2) i.e; 14%. Uncontrolled Diabetic patients were observed to fall under the category of Borderline (5.2 – 6.2) i.e; 34%.
- Figure 6 depicts the information that most common observed symptoms were SOB, Chest pain, Palpitations, Heart burn.
- Figure 7 depicts the information that significant difference was found after counselling the patients through KAP and PIL counselling and it was observed that the counseling was effective.Verbal counseling – 168 (69%),PILs – 79 (30%) Verbal counseling was found to be more effective than PIL counseling.
- Table 1 summarizes that among sampled population, both smokers and alcoholics were more in males (30.76%, 23.07%) than in females (3.64%, 0%) respectively..
- Table 2 summarizes that majorly observed Cardiac Event History was CAD in both males (7%)and females (13%). Next most observed was Angina (6%) in males and MI (8%) in females. The next highly observed was Angina (5%) in females and MI in males (3%). Commonly observed cardiac diseases in males – CAD, Angina, MI.
<div align="center">Commonly observed cardiac diseases in females – CAD, MI, Angina.</div>

DISCUSSION:

- A cross sectional observational study was conducted on "analysing which type of Major Adverse Cardiovascular Events (MACE) among diabetic population and the effect of patient counselling through knowledge, attitude and practice (KAP) questionnaire in diabetic population".
- 18 – 80 who were diagnosed with diabetes with and without cardiovascular diseases were selected as the subjects to conduct the study. A total of 247 subjects met the inclusion criteria and were included in the study. The data obtained was tabulated and analyzed.
- Majority of the sample was observed to be under Uncontrolled diabetic category i.e., 177 (71%). The remaining sample was observed to be under Controlled diabetic category which is 70 (28%).
- Out of 247, the patients were divided into two groups Controlled Diabetic group (n=70) and Uncontrolled group (n=177). Out of them 154 were with MACE and 93 were without MACE. The numbers of male patients were 119 (48%) and were less than female patients who were 128 (52%). Patients with mean age of female group was 53±38.18 years with minimum of 26 and maximum of 80 years and that of male group was 54±36.76 with minimum of 28 and maximum of 80 years.
- Majority of the Controlled Diabetic patients were found to fall under Pre-Hypertension and Stage – I Hypertension (46%) and Uncontrolled Diabetic patients were observed to fall under the category of Stage – I Hypertension (37%) which was comparable to the study that was conducted by Murray Epstein et.al. conducted a study on 'Resistant Hypertension: Prevalence and Evolving Concepts' [6].
- Males were more among uncontrolled group where as female dominated the controlled group that was in concordance by the study conducted by Manson JE, Ajani UA, et al. conducted a study on 'A prospective study of cigarette smoking and the incidence of diabetes mellitus among US male physicians' [7].
- It says that majority of both (12%) male and female controlled diabetic patients have diabetes since 6 – 10 of duration. It can also be derived that majority of both (28%) male and female uncontrolled diabetic patients has diabetes since 6 – 10 years of duration which was comparable to study which was conducted by the Nepal Medical Association April 2013 [8].
- Majority of the Controlled Diabetic patients were observed to have total cholesterol under the category of Desirable (3 – 5.2) i.e; 14%. Uncontrolled Diabetic patients were observed to fall under the category of Borderline (5.2 – 6.2) i.e; 34% comparable to study that was conducted by Christiane L. Haase et.al..[5]
- It was observed that Smokers were 85 (34%) and non smokers were 162 (65%); Alcoholics were 57 (23%) and Non alcoholics were 190 (77%). Smokers and alcoholics were more in males than in females which was comparable to study that was conducted by Mohammed El Sofiani et al. on 'The Relationship of Acculturation to Cardiometabolic Risk Factors among U.S. South Asians Findings from the MASALA Study published online 2013 Jan 14' [10].
- It says that in females both hypertension and total cholesterol might have lead to symptoms of MACE where as in males only total cholesterol might have lead to symptoms of MACE.
- It summarizes that in both controlled and uncontrolled diabetic patients in both males and females Cardiac Event history was observed in the age interval of 51 – 60 years and it is there is no relationship between Cardiac Event History, Gender and Age. Comparable to study that was conducted by Ravi Dhingra, MD, et al..[9]

- It summarizes that in controlled group of diabetes majority of males and females have developed the symptoms of MACE in the age interval of 61 – 70 where as in uncontrolled group of diabetes majority of males and females have developed to show the symptoms of MACE in the age interval of 51- 60 itself.
  Controlled – SOB, Heat burn, Chest pain, Palpitations.
  Uncontrolled – SOB, Chest pain, Palpitations, Heart burn, Pedal edema, Night sweats.
- It summarizes that significant difference was found after counseling the patients through KAP and PIL counselling and it was observed that the counseling was effective. Verbal counseling – 168 (69%)　PILs – 79 (30%) Verbal counseling was found to be more effective than PIL counseling comparable to study that was conducted by R Malathy et al..[11]
- It summarizes that majorly observed Cardiac Event History was CAD in both males (7%)and females (13%). Next most observed was Angina (6%) in males and MI (8%) in females. The next highly observed was Angina (5%) in females and MI in males (3%).Commonly observed cardiac diseases in males – CAD, Angina, MI.Commonly observed cardiac diseases in females – CAD, MI, Angina.

CONCLUSION:

Based on the results obtained, our study reveals that both males and females under uncontrolled diabetic population had Coronary Artery Disease as the major cardiovascular disease. The present study also shows that verbal counseling was more effective than counseling through Patient Information Leaflets. The study results conclude that the patient's knowledge, attitude and practice on diabetes were improved by patient counseling.

LIMITATIONS:

Study pertaining to identifying cardiovascular risk is more useful when performed on multicentre basis. Our study was conducted in short time period and that made it difficult in follow up. Our study did not include people who had congenital anomalies and autoimmune disorders.

Funding: No funding resources.

Conflict of Interest: None declared.

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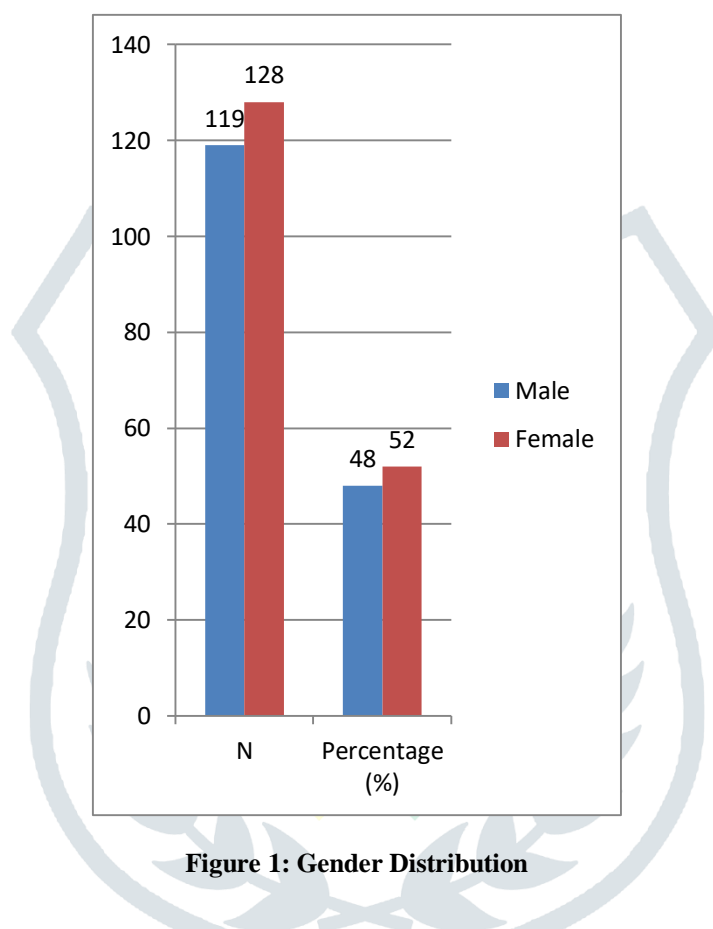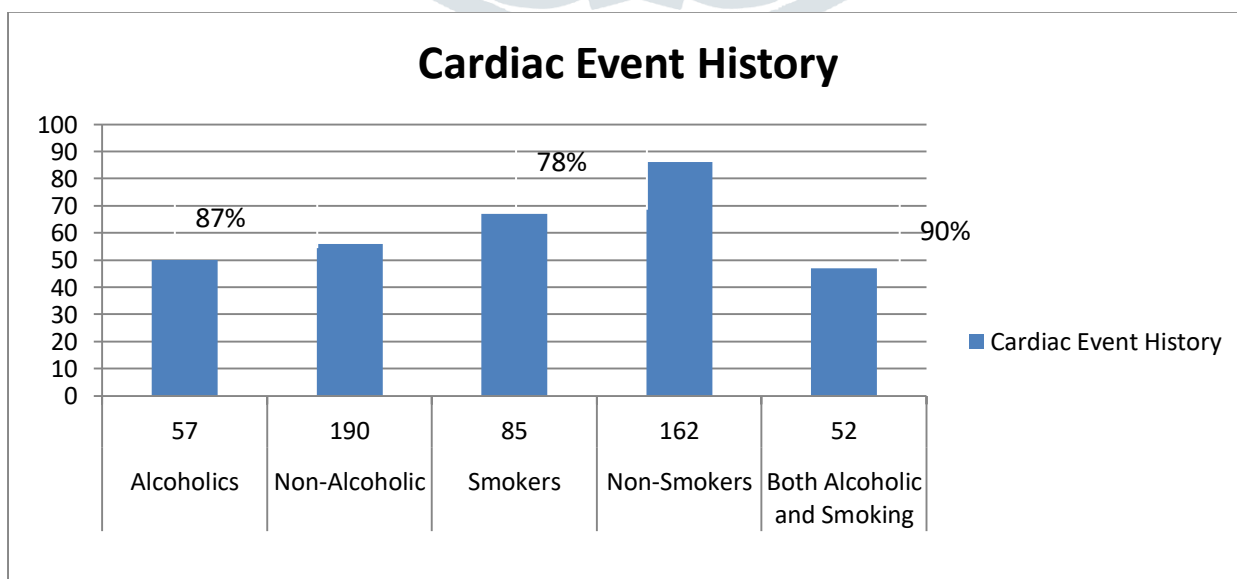

Figure 1: Gender Distribution

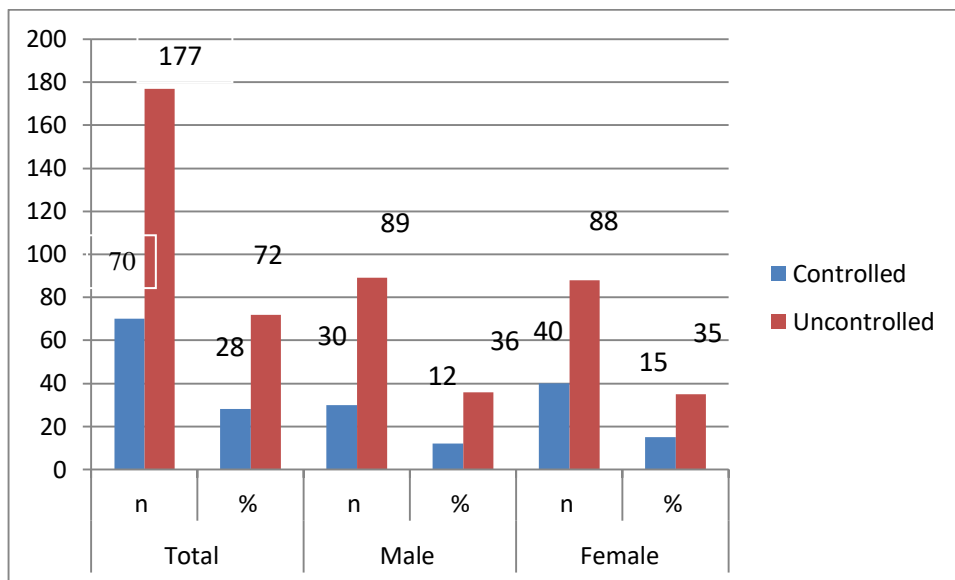**Figure 2: Relation between Smoking, Alcohol and
Cardiac Event History**

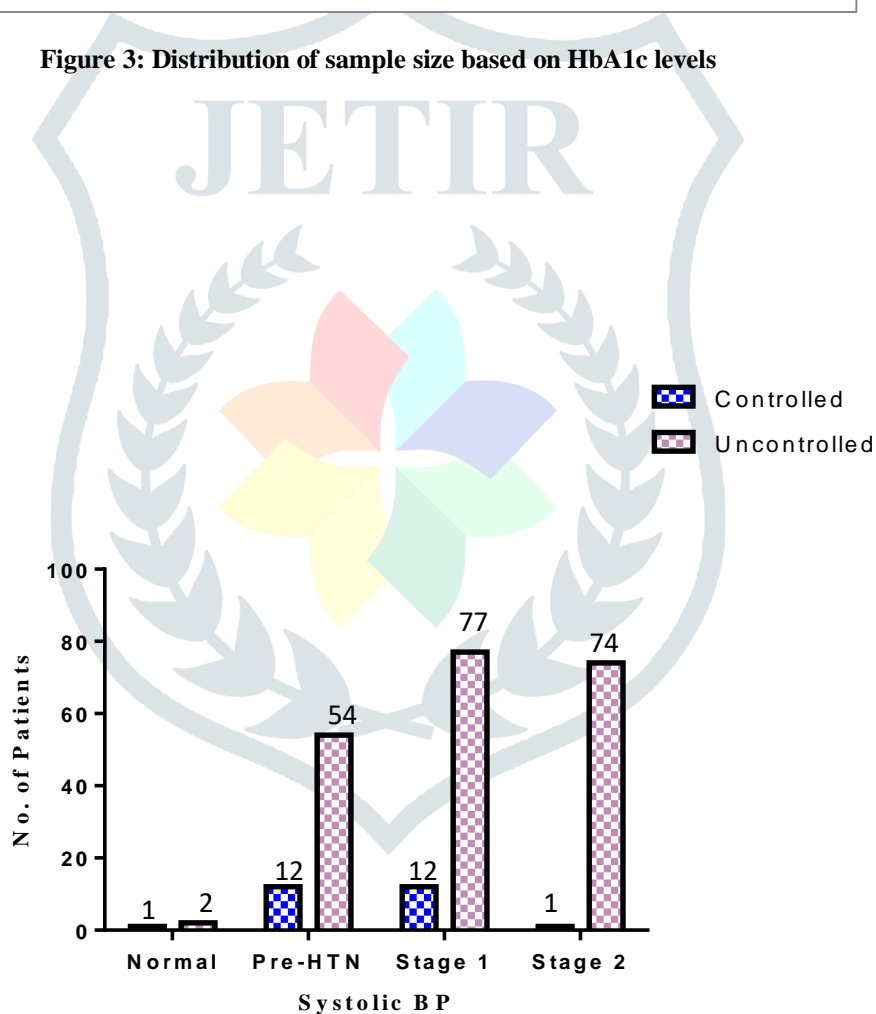**Figure 3: Distribution of sample size based on HbA1c levels**

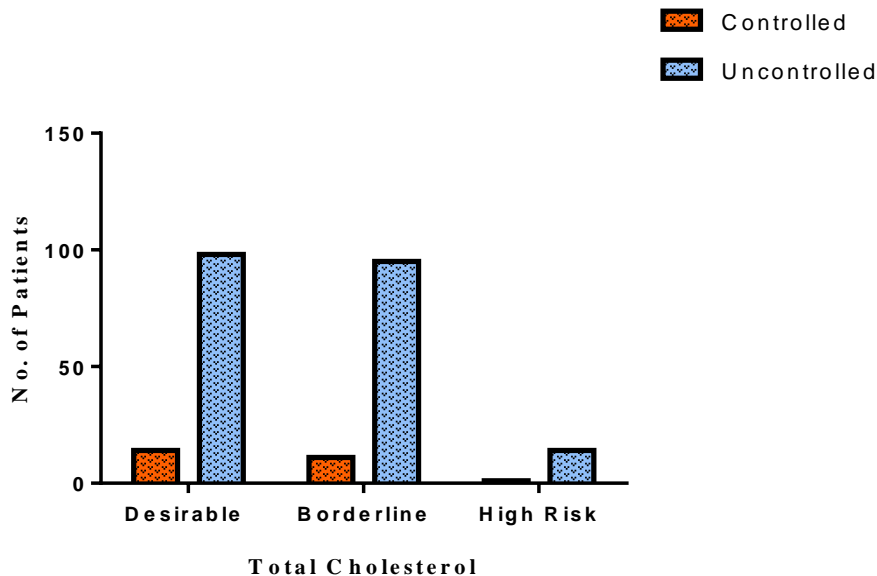**Figure 4: Distribution of BP among the sample**

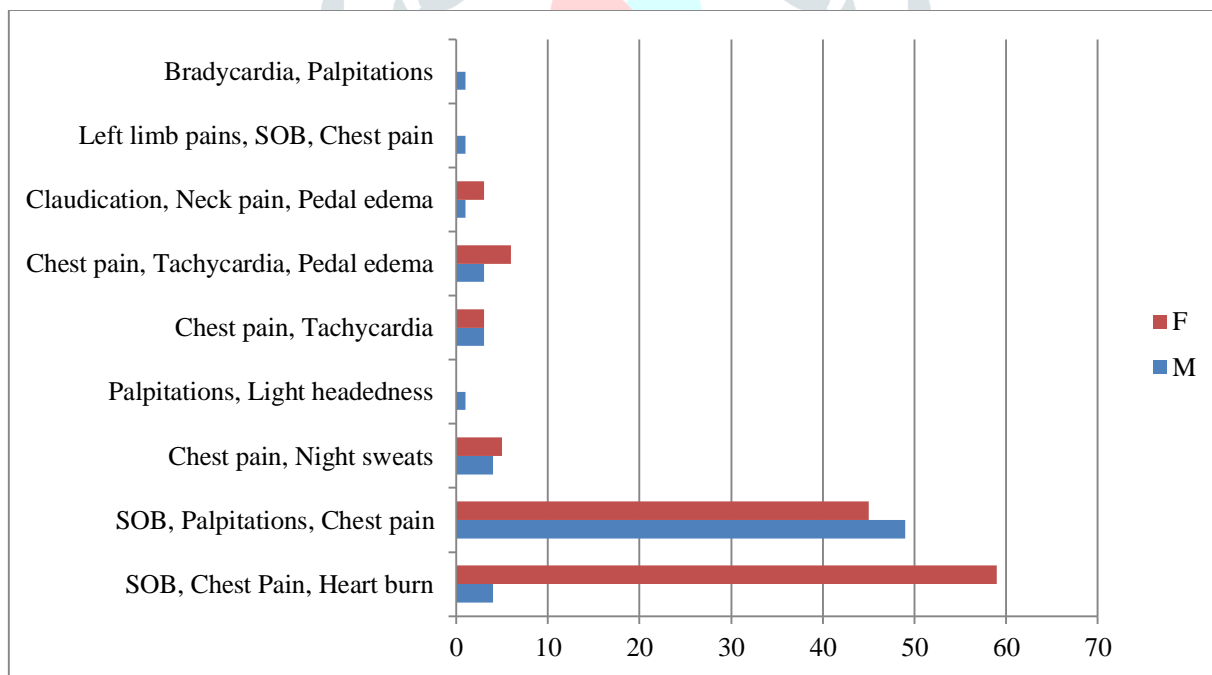**Figure 5: Distribution of Total Cholesterol among the sample**
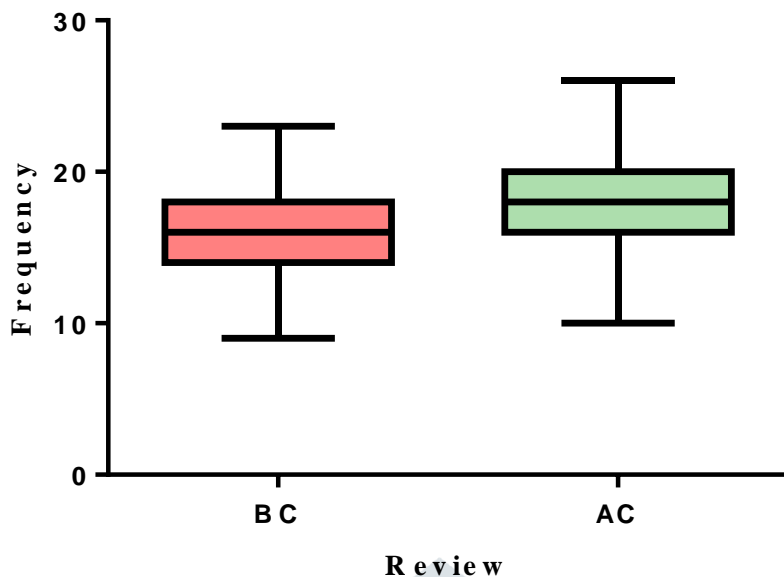

Figure 6: Symptoms Of MACE

Figure 7: Effect of Patient Counselling through KAP(Score)

Table 1: Distribution of sample based on their Social Habits

Gender	Social Habit		P value
	Smokers	**Non-smokers**	
Male	76	43	<0.0001
Female	09	119	
	Alcoholic	**Non- Alcoholic**	
Male	57	62	<0.0001
Female	0	128	

Table 2: Distribution of Cardiac Event History in Males and Females.

Cardiac Event History	Males	Females
CAD,LVD	13	23
POST PTCA,CAD,MI	1	0
CARDIAC STROKE	1	0
CAD WITH MI,LVD	0	1
CAD WITH MODERATE LVD	2	0
LVD,ATRIAL FIBRILLATION	0	1
STENT	3	2
MI	6	15
ANGINA	12	9
CAD WITH AWMI	2	1
INFERIOR LATERAL WALL MI WITH MILD CID	1	0
ICMP	3	0
CHF	0	6
CID WITH PTCA STENT	0	1
CAD WITH SEVERE LVD	2	1
CAD WITH MILD LVD	4	8
PTCA	4	0
BIPASS SURGERY	1	0
CAD WITH LBF	1	0
CAD WITH ANGINA	1	0
PERIPHERAL ARTERY MYOPATHY	1	0
MI	0	1
ANGINA,MI,CARDIAC STENT	0	1
ATHEROSCLEROSIS	5	2
CAD WITH CHF,SEVERE LVD	2	0